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CONTENTS

PAGE

The Hypocreales of North America—II: Fred J. Seaver 177

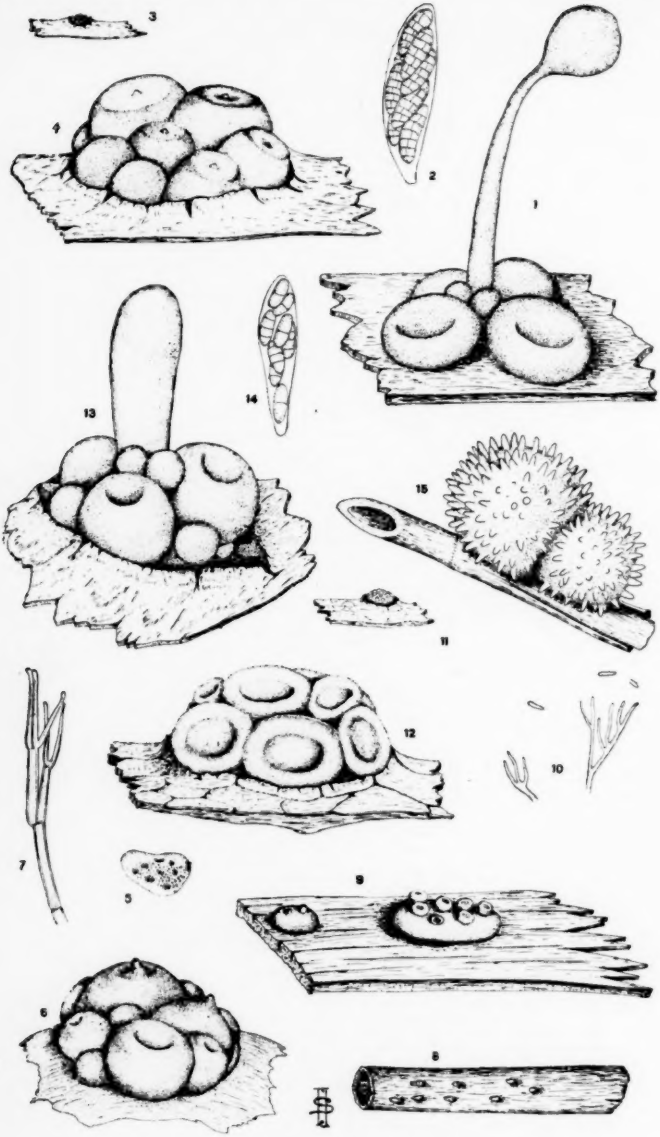
A Notable Species of Gymnosporangium from Colorado: Frank D. Kern 208

A New Poisonous Mushroom: William A. Murrill . 211

A Species of Discosia on Living Bull Pine Seedlings: F. D. Heald 215

Noteworthy Additions to the Mycological Herbarium . 218

News and Notes 220



CREONECTRIEAE

MYCOLOGIA

VOL. I SEPTEMBER, 1909 NO. 5

THE HYPOCREALES OF NORTH AMERICA—II

FRED J. SEAVER

(WITH PLATE 13, CONTAINING 15 FIGURES)

Tribe II. CREONECTRIEAE

Conidial phase profuse, giving rise to a stroma producing at first conidiophores and conidia, later perithecia; stroma fleshy, depressed, tubercular or stalked, conidia variable; perithecia seated on or surrounding the stroma; usually in dense cespitose clusters or occasionally scattered but always entirely superficial; perithecia and spores as in Nectrieae.

Stroma upright, stalked, surrounded at the base by the cespitose perithecia.	
Spores 1-septate.	12. SPHAEROSTILBE.
Spores muriform.	13. MEGALONECTRIA.
Stroma depressed or tubercular, often concealed at maturity by the perithecia.	
Spores simple.	
Spores hyaline.	14. ALLANTONECTRIA.
Spores brown.	15. SPHAERODERMATELLA.
Spores compound.	
Spores 1-septate.	
Spores hyaline.	16. CREONECTRIA.
Spores brown.	17. MACBRIDELLA.
Spores more than 1-septate.	
Perithecia dark blue (black to naked eye).	18. GIBBERELLA.
Perithecia bright colored, red, yellow, etc.	
Perithecia cespitose on a depressed stroma.	19. SCOLECONECTRIA.

[MYCOLOGIA for July, 1909 (1: 131–176), was issued 22 July 1909.]

Perithecia echinulately arranged on a subglobose stroma.	20. ECHINODOTHIS.
Spores muriform.	
Spores hyaline.	21. THYRONECTRIA.
Spores brown.	22. THYRONECTROIDEA.

12. SPHAEROSTILBE Tul. Fung. Carp. **1**: 130 (in note). 1861

Stroma (*Stilbum, Atractium, Microcera*) consisting of a slender stalk with a subglobose head or conical in form; perithecia bright colored, membranaceous, globose, subglobose or ovate; asci cylindrical or subcylindrical, 8-spored; spores hyaline, 1-septate, elliptical or subelliptical.

Type species: *Stilbum aurantiacum* Babingt.

Stroma consisting of a slender stalk with a clavate or subglobose head.	
Spores small, 10–14 × 4–6 mic.	1. *S. gracilipes.*
Spores large, 22–26 × 7 mic.	2. *S. cinnabarina.*
Stroma conical in form.	
On bark.	3. *S. flammea.*
On scale insects.	4. *S. coccophila.*

1. SPHAEROSTILBE GRACILIPES Tul. Fung. Carp. **1**: 130. 1861

Strilbum gracilipes Tul. Ann. Sci. Nat. IV. **5**: 114. 1856.

Stilbum corynoides Ellis & Everh. Jour. Myc. **1**: 153. 1885.

Stroma consisting of a slender stalk 2–3 mm. high of a grayish color with a globose, orange head .5–1 mm. in diameter; conidia elliptical, hyaline, 5–6 × 2 mic.; perithecia in dense cespitose clusters 1–2 mm. in diameter at the base of the stalked stroma, 15–30 in each cluster, reddish, becoming pale (in dried specimens often pale yellow), 250–300 mic. in diameter, nearly globose, partially collapsing or entire, slightly roughened; asci cylindrical, 75–80 × 7–8 mic.; 8-spored; spores mostly 1-seriate, elliptical to subfusoid, hyaline, 1-septate, 10–14 × 6 mic., usually not constricted.

On bark of various trees and shrubs, *Carya, Citrus, Hibiscus, Platanus.*

TYPE LOCALITY: Europe.

DISTRIBUTION: S. Carolina to Florida and Louisiana.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 12, f. 1–4.*

EXSICCATI: Ellis & Everh. N. Am. Fungi, *2131, 2132;* Ravenel, Fungi Am. Exsicc. *285;* Other specimens examined: Florida, *Nash.*

2. SPHAEROSTILBE CINNABARINA (Mont.) Tul. Fung. Carp. **1**: 130. 1861

Stilbum (*Atractium*) *cinnabarinum* Mont. Ann. Sci. Nat. II. **8**: 360. 1837.

Stroma with a slender stalk 1–2 mm. long and a globose or clavate, red head; conidia nearly elliptical, straight or a little curved, 3–5 × 2 mic., granular within; perithecia few, surrounding the base of the stalked stroma, sessile, globose, smooth, orange, finally partially collapsed; asci clavate, about 80 × 13–16 mic.; spores 2-seriate, ovate, 22–26 × 7 mic., filled with numerous oil-drops.

On bark of trees and shrubs.

TYPE LOCALITY: Cuba.

DISTRIBUTION: S. Carolina to Mexico and Cuba.

EXSICCATI: Ellis & Everh. N. Am. Fungi *2133*. Other specimens examined: Cuba, *Wright;* Louisiana, *Langlois 168, 2179.*

The specimens examined did not show mature perithecia and measurements of asci and spores are from Saccardo. The conidial phase scarcely differs from *Sphaerostilbe gracilipes* Tul.

3. SPHAEROSTILBE FLAMMEA (Berk. & Rav.) Tul. Fung. Carp. **1**: 130. 1861

Atractium flammeum Berk. & Rav.; Berk. & Broome, Ann. Mag. Nat. Hist. **13**: 461. 1854.

Stilbum flammeum Tul. Ann. Sci. Nat. IV. **5**: 114 (No. 757). 1856.

Stroma conical in form with the top finally becoming flattened; conidia fusiform, a little curved, 5–8-septate, about 60–75 × 5–7 mic.; perithecia nearly globose, bright red, smooth or only minutely rough, crowded on or near the base of the stroma; asci cylindrical, about 75–80 × 8–10 mic., 8-spored; spores 1-septate, elliptical to subfusoid, 1-septate, hyaline, 15 × 6–7 mic.

On bark of trees, *Acer, Crataegus, Salix.*

TYPE LOCALITY: Europe.

DISTRIBUTION: Ontario to Louisiana and S. Carolina.

ILLUSTRATIONS: Tul. Fung. Carp. **3**: *pl. 13, f. 10–13.*

EXSICCATI: Ellis & Everh. N. Am. Fungi, *3311*. Other specimens examined: Louisiana, *Langlois 2290;* N. Jersey, *Ellis;* Ontario, Canada, *Dearness.*

4. SPHAEROSTILBE COCCOPHILA (Desm.) Tul. Fung. Carp. **3**: 105. 1865

Microcera coccophila Desm. Ann. Sci. Nat. III. **10**: 359. 1848.

? *Nectria aurantiicola* Berk. & Br. Jour. Linn. Soc. **14**: 117. 1875.

? *Nectria aglaeothele* Berk. & Curtis, Grevillea **4**: 45. 1875.

Nectria subcoccinea Sacc. & Ellis, Michelia **2**: 570. 1882.

Stroma consisting of a short, stout stalk with an orange head; conidia straight or more often curved, long, fusiform, 3–7-septate, 50–90 × 5–6 mic., occasionally shorter; perithecia more or less cespitose, bright orange, with a prominent, rather acute ostiolum; asci cylindrical, 75 × 8–10 mic., 8-spored; spores 1-seriate, elliptical or subelliptical, 12–18 × 7–9 mic.

On dead scale insects on bark, etc.

TYPE LOCALITY: France.

DISTRIBUTION: Florida to Alabama, Pennsylvania and the West Indies.

ILLUSTRATIONS: Fawcett, Bull. Fl. Agric. Exp. Sta. **94**: *f. 2–3.*

EXSICCATI: Ellis, N. Am. Fungi, *1333;* Ravenel, Fungi Car. Exsicc. *57.* Other specimens examined: Florida, *Hume 39.*

The exsiccati cited are distributed under other names but both show the characteristic conidia and perithecia of the above species. Also both occur on scale insects.

13. MEGALONECTRIA Speg. An. Soc. Ci. Argent. **12**: 82. 1881

Stroma consisting of a slender stalk with a globose head; perithecia globose or subglobose, bright colored, red or reddish, entire or collapsing, borne in cespitose clusters on or surrounding the base of the stroma; asci clavate, 8-spored; spores elliptical, many-septate, becoming muriform, hyaline.

Type species: *Sphaeria pseudotrichia* Schw.

Distinguished from *Sphaerostilbe* by the muriform spores.

1. MEGALONECTRIA PSEUDOTRICHIA (Schw.) Speg. An. Soc. Ci. Argent. **12**: 82. 1881

Sphaeria pseudotrichia Schw.; Berk. & Curtis, Jour. Acad. Nat. Sci. Phil. II. **2**: 289. 1853.

Nectria pseudotrichia Berk. & Curt. Jour. Acad. Nat. Sci. Phil. II. **2**: 289. 1853.

Sphaerostible pseudotrichia Berk. & Broome, Jour. Linn. Soc. **14**: 114. 1875.

Stroma consisting of a slender stalk with a subglobose, reddish head; conidia 3–5 × 2 mic., hyaline; perithecia nearly globose, subcespitose, usually in or surrounding the base of the stroma, red, minutely rough, finally collapsing; asci clavate, very broad, 8-spored, 60–75 × 20–22 mic.; spores 2-seriate or irregularly crowded, large, 7–9-septate and muriform, yellowish-hyaline, 25–35 × 7–8 mic. (*pl. 13, f. 1–2*).

On bark, wood, etc.

TYPE LOCALITY: Surinam, S. America.

DISTRIBUTION: West Indies.

ILLUSTRATIONS: Berk. & Curtis, Jour. Acad. Nat. Sci. Phil. **2**: *pl. 25, f. 9.*

SPECIMENS EXAMINED: Cuba, *Murrill 156;* Jamaica, *Cockerell 37;* Porto Rico, *Heller 773, 775;* S. America, ex. Herb. *Schweinitz.*

DOUBTFUL SPECIES

Megalonectria caespitosa Speg. Bol. Acad. Nat. Cien. Corb. **11**: 541. 1889.

This species has been distinguished by the larger spores which range from 30–45 × 10–12. The only specimen examined is from the herbarium of Prof. Bessey and according to the label was found on wood supporting a south Mexican orchid in the greenhouse at Lincoln, Nebraska.

14. ALLANTONECTRIA Earle; Greene, Plantae Bakerianae **2**: 11. 1901

Nectriella Sacc. (in part).

Perithecia bright colored, red, occurring in cespitose clusters on a stroma as in *Creonectria;* asci cylindrical to clavate, 8-spored; spores allantoid, simple, hyaline.

Type species: *Allantonectria Yuccae* Earle.

Distinguished from *Creonectria* by the simple spores which in the type species are allantoid in form.

1. ALLANTONECTRIA YUCCAE Earle l. c.

Perithecia densely cespitose in clusters of 12–20, seated on a stroma; perithecial clusters erumpent, thickly scattered or sub-

confluent, averaging about 1 mm. in diameter; perithecia bright red becoming dull red with age, subglobose, smooth, or minutely roughened, partially collapsing when dry, 100–125 mic. in diameter; asci clavate or cylindrical, 8-spored; spores 2-seriate or irregularly crowded, allantoid, 4–5 × 1 mic.

On dead leaves of *Yucca* sp.

TYPE LOCALITY: Hermosa, Colorado.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Colorado, *Baker* (type).

This species scarcely differs from Rouméguere's Fungi Sel. Exsicc., *6860* and Saccardo's Mycotheca Ital. *866* so far as we can see, both of which are labeled *Nectriella miltina* (Mont.) Sacc. The species however is probably distinct from that species, in which the spores are described as ovoid.

15. **Sphaerodermatella** gen. nov.

Stroma erumpent, fleshy; perithecia in dense cespitose clusters seated on the stroma which is entirely obscured at maturity, more or less rough and furfuraceous; asci broad-clavate to ovoid, 4–8-spored; spores simple becoming dark colored and opaque.

Distinguished from *Sphaeroderma* by the absence of effuse stroma and the cespitose arrangement of the perithecia.

1. **Sphaerodermatella Helleri** (Earle)

Melanospora (*?*) *Helleri* Earle, Muhlenbergia **1**: 13. 1901.

Sphaeroderma Helleri Sacc. & Sacc. Syll. Fung. **17**: 781. 1905.

Stroma erumpent; perithecia superficial, densely cespitose, 3 or 4–20 on an indistinct basal stroma, large, .5–1 mm. in diameter, deeply collapsing, grayish externally from irregular, flat, finally deciduous, wart-like projections apparently formed by the cracking of the hard outer layer; substance of the perithecial wall of a dark brown color, soft, composed of small-celled parenchyma; ostiolum slightly prominent when young, perforation obscure when collapsed; asci oblong, about 100 × 30 mic., soon evanescent; 4–8-spored; spores 2-seriate, elliptical, simple, at first hyaline, finally opaque and black, surrounded with a more or less distinct hyaline coating about 25–28 × 12–20 mic.; expelled and blackening the matrix when mature; paraphyses indistinct.

On bark of tree.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Porto Rico, *Heller* (type).

16. **Creonectria** gen. nov.

Nectria Fries, Summa Veg. Scand. 387 (in part). 1849.

Stroma fleshy or subfleshy, tubercular or depressed, red, yeilow, brown, or occasionally black (at least with age); perithecia globose or subglobose with the ostiolum often depressed with age, smooth, verrucose or furfuraceous, superficial on or surrounding the stroma; asci cylindrical, or clavate, 8-spored, with the spores occasionally accompanied by numerous other minute spore-like bodies in the ascus; spores 1–2-seriate or irregularly crowded, elliptical to fusoid, straight or curved, 1-septate, hyaline; paraphyses present or not evident.

Type species: *Tremella purpurea* L.

Distinguished from *Nectria* by the presence of a stroma. Conidial phase represented by *Tuberculariа, Verticillium,* etc.

Perithecia some shade of red, scarlet, brick-red or brownish-black.
- Perithecia dull brick-red becoming brown or black with age.
  - Ascospores not accompanied by spore-like bodies in the ascus.
    - Perithecia verrucose, covered with coarse granules.
      - Stroma tubercular, prominent. — 1. *C. purpurea.*
      - Stroma concave, not rising above the surface of the substratum. — 2. *C. verrucosa.*
    - Perithecia smooth or only minutely rough, becoming black with age. — 3. *C. atrofusca.*
  - Ascospores accompanied by minute spore-like bodies in the ascus. — 4. *C. Coryli.*
- Perithecia scarlet or blood-red, becoming reddish-purple with age.
  - Spores elliptical or subelliptical with ends obtuse.
    - Perithecia collapsing with age.
      - Becoming truncate. — 5. *C. pithoides.*
      - Becoming pezizoid when collapsed. — 6. *C. rubicarpa.*
    - Perithecia entire; ostiolum very prominent. — 7. *C. mammoidea.*
  - Spores fusoid with ends acute or subacute.
    - Spores narrow-fusoid, 3 times as long as broad. — 8. *C. coccinea.*
    - Spores broad-fusoid, 2 times as long as broad.

Comparatively small, not more than 16 mic. long.
Perithecia vertically collapsing, on *Diatrypella*. 9. *C. nipigonensis.*
Perithecia mostly entire, on coniferous wood. 10. *C. Cucurbitula.*
Comparatively large, 20–25 mic. long. 11. *C. diploa.*
Perithecia pale rose-colored or some shade of yellow or yellowish-white.
Perithecia in cespitose clusters on the stroma.
Spores 10–14 × 3–3.5 mic.
Conidial phase profuse on decaying seeds. 12. *C. seminicola.*
Conidial phase consisting of isolated tubercular stromata. 13. *C. ochroleuca.*
Spores 12–14 × 5 mic. 14. *C. gramnicospora.*
Perithecia scattered over the surface of a tubercular stroma. 15. *C. tuberculariformis.*

1. **Creonectria purpurea** (L.)

Tremella purpurea L. Sp. Pl. **2**: 1158. 1753.
Sphaeria tremelloides Weigel. Obs. Bot. 46. 1772.
Tubercularia vulgaris Tode, Fungi Meckl. **1**: 18. 1790.
Sphaeria cinnabarina Tode, Fungi Meckl. **2**: 9. 1791.
Cucurbitaria cinnabarina Greville, Scot. Fl. Crypt. **3**: 136. 1825.
Nectria cinnabarina Fries, Summa Veg. Scand. 388. 1849.
Nectria Sambuci Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1890**: 246. 1891.
Nectria Meliae Earle, Bull. Torrey Club **25**: 364. 1898.
Nectria Russellii Berk. & Broome, Grevillea **4**: 45.
Nectria offuscata Berk. & Curtis, Grevillea **4**: 45.
Nectria nigrescens Cooke, Grevillea **7**: 50.
Sphaeria dematiosa Schw. Trans. Am. Phil. Soc. II. **4**: 205. 1832.
Sphaeria Celastri Schw.; Fries, El. Fung. **2**: 81. 1827.
Nectria purpurea (L.) Wilson & Seaver, Jour. Myc. **13**: 51. 1907.

Stroma erumpent, tubercular, at first pinkish or yellowish-red becoming darker with age, often brownish and occasionally quite black, 1–2 mm. in diameter and 1–2 mm. high; conidiophores 50–100 mic. long with short lateral branches on which the conidia are borne; conidia 4–6 × 2 mic., elliptical, hyaline; perithecia

springing at first from the base of the stroma which at maturity is concealed by the cespitose clusters of perithecia; individual perithecia nearly globose with the ostiolum rather prominent, becoming slightly collapsed, at first bright, cinnabar-red, becoming darker with age, often brown and occasionally black (when weathered); roughened externally with coarse granules 375–400 mic. in diameter; asci clavate, 8-spored, 50–90 × 7–12 mic.; spores mostly 2-seriate, elliptical, elongated, about 3 times as long as broad with the ends obtuse, 1-septate, hyaline, mostly a little curved, 12–20 × 4–6 mic.; paraphyses very delicate.

On bark of various kinds of deciduous trees and shrubs; *Acer, Amorpha, Ampelopsis, Berberis, Carya, Calycanthus, Celastrus, Cornus, Euonymus, Melia, Morus, Populus, Prunus, Pyrus, Quercus, Rhus, Ribes, Robinia, Rubus, Sambucus, Tilia, Ulmus.*

TYPE LOCALITY: Europe.

DISTRIBUTION: Maine to California and from Ontario to S. Carolina, probably common throughout N. America.

ILLUSTRATIONS: Tode, Fungi Meckl. *pl. 9, f. 68;* Tulasne, Fung. Carp. **3**: *pl. 12;* E. & P. Nat. Pfl. Fam. **1**[1]: *f. 239,* A–D.; Winter, Rabenh. Krypt. Fl. **1**[2]: 87. *f. 1–3.*

EXSICCATI: Ellis, Fungi Nova Caesareenses, *68;* Ellis, N. Am. Fungi, *468;* Ellis & Everhart, Fungi Columbiani, *115;* Bartholomew, Fungi Columbiani, *2334, 2847;* Ravenel, Fungi Am. Exsicc. *339, 4119.*

Other specimens examined: Types or cotypes of the following synonyms have been examined: *Nectria Sambuci* Ellis & Everh., *Nectria Meliae* Earle, *Nectria Russellii* Berk. & Broome, *Nectria offuscata* Berk. & Curtis, *Nectria nigrescens* Cooke, *Sphaeria dematiosa* Schw., and *Sphaeria Celastri* Schw.

This is probably the most common and widely distributed species of the entire order and since it is very variable has been many times redescribed.

2. **Creonectria verrucosa** (Schw.)

Sphaeria verrucosa Schw. Trans. Am. Phil. Soc. II. **4**: 204. 1832.

Nectria verrucosa Sacc. Syll. Fung. **2**: 509. 1883.

Stroma fleshy, concave or convex, scarcely rising above the surface of the substratum; perithecia cespitose in clusters 1–2 mm. in diameter, erumpent through the outer bark; individual

perithecia nearly globose, dull red, very rough externally with coarse granules, 250–300 mic. in diameter; asci cylindrical to clavate, 8-spored, 50–65 × 5–6 mic.; spores 2-seriate, 1-septate, elliptical, with ends obtuse, straight or a little curved, usually not constricted, 12–16 × 4 mic.

On dead branches of *Morus, Sassafras* and *Melia.*

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Delaware to N. Dakota and Alabama.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 12, f. 13–19.*

EXSICCATI: Ellis & Everhart, N. Am. Fungi, *2371.* Other specimens examined: Alabama, *Little;* Connecticut, *Thaxter;* Delaware, *Commons;* N. Jersey, *Ellis;* N. Dakota, *Seaver;* Pennsylvania, *Schweinitz* (type); S. Carolina, *Ravenel.*

Distinguished from *C. purpurea* (L.) Seaver only by the depressed stroma.

3. **Creonectria atrofusca** (Schw.)

Sphaeria atrofusca Schw. Trans. Am. Phil. Soc. II. **4**: 206. 1832.
Nectria atrofusca Ellis & Everh. Jour. Myc. **1**: 140. 1885.

Stroma fleshy or subfleshy, rather dark colored, erumpent but not rising much above the surface of the bark; perithecia in cespitose clusters on the stroma, clusters variable in size, averaging 1–2 mm., dark colored, nearly black in dried specimens, brownish-black with transmitted light, small mostly less than 200 mic. in diameter, subglobose with a prominent papilliform ostiolum, mostly collapsing when dry; asci subcylindrical, 45–50 × 7 mic., 8-spored; spores partially 2-seriate above, 1-seriate below, hyaline, 1-septate, slightly constricted at the septum, subfusoid with the ends slightly narrowed.

On dead branches of *Staphylea trifolia.*

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: Pennsylvania.

EXSICCATI: Ellis, N. Am. Fungi, *1547.* Other specimens examined: Pennsylvania, *Schweinitz* (type).

The species is distinguished by its host as well as the very dark colored perithecia.

4. **Creonectria Coryli** (Fuckel)

Nectria Coryli Fuckel, Symb. Myc. 180. 1869.
Chilonectria Coryli Ellis & Everh. N. Am. Pyrenom. 116. 1892.

Perithecia cespitose on an erumpent stroma, globose, smooth, at first bright red becoming blackish, entirely black in weathered specimens, collapsing becoming pezizoid; asci clavate, 85–100 × 10–12 mic., 8-spored but with spores often obscured by numerous, allantoid spore-like bodies which are present in the ascus; spores fusoid, 1-septate, with a short curved appendage at each end, 10–15 × 2.5–3 mic.

On branches of deciduous trees and shrubs; *Betula, Corylus, Crataegus, Lonicera, Populus, Rhus, Salix, Symphoricarpus.*

TYPE LOCALITY: Europe.

DISTRIBUTION: New Jersey to Ontario and N. Dakota.

EXSICCATI: Ellis, N. Am. Fungi, *159*. Other specimens examined: Delaware, *Commons;* New Jersey, *Ellis;* N. Dakota, *Brenckle;* Ontario, Canada, *Dearness.*

The species is very distinct in its spore characters.

5. **Creonectria pithoides** (Ellis & Everh.)

Nectria pithoides Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1890**: 247. 1891.

Stroma erumpent, yellowish; perithecia seated on the stroma in dense clusters 1.5–2.5 mm. in diameter, individual perithecia bright red, collapsing so as to become truncate, resembling the head of a barrel with the ostiolum appearing as a light translucent dot in the center, 200–250 mic. in diameter; asci cylindrival, 70–80 × 5 mic., 8-spored; spores elliptical, 1-septate, with an oil-drop in each cell, hyaline, 6–10 × 3–4 mic. (*pl. 13, f. 3–4*).

On bark of dead alders.

TYPE LOCALITY: British Columbia.

DISTRIBUTION: Known only from type locality.

EXSICCATI: Ellis & Everh. N. Am. Fungi, *2750* (cotype).

Distinguished by the bright red perithecia which are decidedly barrel-shaped when dry.

6. **Creonectria rubicarpa** (Cooke)

Nectria rubicarpa Cooke, Grevillea **7**: 50. 1878.

Perithecia cespitose in small, dense clusters, 1–2 mm. in diameter, minutely roughened, bright red becoming darker with age, collapsing and becoming deeply pezizoid; asci cylindrical to clavate, 55–60 × 6 mic., 8-spored; spores 1-seriate or partially 2-seriate above, elliptical, hyaline, 1-septate, 10–13 × 4–4.5 mic. scarcely constricted (*pl. 13, f. 11–12*).

On dead limbs of *Gelsemium* and stems of *Ilex*.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: New Jersey to Alabama.

EXSICCATI: Ellis, N. Am. Fungi, *80;* Ravenel, Fungi Am. Exsicc. *341*. Other specimens examined: Alabama, *Earle;* New Jersey, *Ellis*.

The species is distinguished by the dense clusters of collapsing perithecia and the small size of the spores.

7. **Creonectria mammoidea** (Phil. & Plow.)

Nectria mammoidea Phil. & Plow. Grevillea **3**: 126. 1875.

Perithecia cespitose in clusters 1–3 mm. in diameter or more or less scattered, surrounding a brownish stroma, very large, averaging about 500 mic. in diameter, ovate, tapering above into a large, obtuse ostiolum, bright red with ostiolum often darker, shining, entire; asci cylindrical or slightly clavate, 100 × 7–8 mic., 8-spored; spores 1-seriate or partially 2-seriate above, oblique, subfusoid, 1-septate, usually slightly unequal-sided, 18–20 × 6–7 mic.

On wood and bark.

TYPE LOCALITY: England.

DISTRIBUTION: New Jersey to Ontario.

ILLUSTRATIONS: Grevillea **3**: *pl. 42, f. 5*.

SPECIMENS EXAMINED: New Jersey, *Ellis;* Ontario, *Macoun;* also specimens from the herbarium of *Plowright*.

8. **Creonectria coccinea** (Pers.)

? *Sphaeria decidua* Tode, Fungi Meckl. **2**: 31. 1791.

Sphaeria coccinea Pers. Ic. et Descr. **2**: 47. 1800.

Nectria coccinea Fries, Summa Veg. Scand. 388. 1849.

Stroma yellowish, springing from the crevices of bark in irregular patches; perithecia cespitose in dense irregular clusters often several mm. in diameter, or occasionally scattered around the stroma; individual perithecia ovate with a prominent ostiolum, bright red, almost scarlet, color somewhat variable, smooth or very minutely roughened, mostly entire, about 300 mic. in diameter; asci cylindrical or clavate, 8-spored, 80–90 × 8–10 mic.; spores 1-seriate, fusoid, 12–16 × 4–5 mic.

On bark or more rarely on decorticated wood, *Acer, Fagus, Fraxinus, Magnolia, Melia, Ulmus,* etc.

TYPE LOCALITY: Europe.

DISTRIBUTION: Vermont to N. Dakota and W. Virginia, probably extending over a much wider range.

ILLUSTRATIONS: Pers. Ic. & Descr., *pl. 12, f. 2.*

EXSICCATI: Ellis, N. Am. Fungi, *161;* Ellis & Everh. N. Am. Fungi, *618;* E. Barholomew, Fungi Columbiani, *2043, 2238.* Other specimens examined: New York, *Clinton, Seaver;* N. Dakota, *Seaver;* N. Jersey, *Ellis;* Ontario, Canada, *Dearness;* Vermont, *Burt, Orton;* W. Virginia, *Orton.*

So far as we can see the species scarcely differs from *Nectria ditissima* Tul. If the two species are distinct, the characters are so poorly understood that they have been badly confused. The specimens examined which have been referred to these two names are identical.

9. **Creonectria nipigonensis** (Ellis & Everh.)

Nectria nipigonensis Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1893**: 129. 1893.

Stroma depressed, yellowish, about .5 mm. in diameter; conidia minute, allantoid, 3–4 × 1 mic.; perithecia cespitose, nearly globose, about 250 mic. in diameter, reddish becoming darker with age, finally collapsing at the apex, smooth; asci cylindrical, 8-spored, 50–55 × 6–7 mic.; spores 1-seriate, fusoid or occasionally subelliptical, 1-septate, usually not constricted at the septum.

On the erumpent disc of *Diatrypella.*

TYPE LOCALITY: Lake Nipigon, Canada.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Canada, *Macoun* (type).

Distinguished by the pezizoid perithecia and broad-fusoid spores.

10. **Creonectria Cucurbitula** (Sacc.)

Nectria Cucurbitula Sacc. Michelia **1**: 409. 1878. Not *N. Cucurbitula* (Tode) Fr.

Perithecial clusters erumpent and often very irregular in form, 1–2 mm. in diameter, consisting of numerous densely cespitose perithecia; individual perithecia bright red later becoming reddish-purple, ovate with a prominent rather obtuse ostiolum, entire or very rarely collapsing; asci cylindrical or clavate, 75–100 × 6–8 mic., 8-spored; spores at first crowded and partially 2-seriate, finally becoming 1-seriate, obliquely arranged with ends over-

lapping, broad-fusoid, rarely subelliptical, 1-septate and not constricted at the septum, hyaline, 14–16 × 5–7 mic. (mostly 15 × 7 mic.).

On bark of *Pinus, Abies* and *Larix*.

TYPE LOCALITY: Europe.

DISTRIBUTION: Newfoundland to New York and Ontario.

SPECIMENS EXAMINED: Newfoundland, *Waghorne;* New York, *Peck;* Ontario, Canada, *Macoun.*

The species is distinct both in external and internal characters.

11. **Creonectria diploa** (Berk. & Curtis)

Nectria diploa Berk. & Curtis, Jour. Linn. Soc. **10**: 378. 1869.

Perithecia in dense erumpent clusters about .5 mm. in diameter, individual perithecia minute, ovate, nearly smooth, bright red, finally collapsing; asci cylindrical, 8-spored; spores vertically 2-seriate, very large, fusoid, 1-septate, hyaline, with 2–4 oil-drops, 20–25 × 7–10 mic.

On bark of *Alnus* sp.

TYPE LOCALITY: S. Carolina.

DISTRIBUTION: Known only from type locality.

EXSICCATI: Ravenel, Fungi Car. Exsicc. *55.*

Individual perithecia resemble those of *Nectria episphaeria* (Tode) Fries but differ in the very large size of the spores. The dense clusters of perithecia seem to indicate the presence of a stroma although the specimens are too old to show any definite stroma.

12. **Creonectria ochroleuca** (Schw.)

Sphaeria ochroleuca Schw. Trans. Am. Phil. Soc. II. **4**: 204. 1832.

Nectria ochroleuca Berk. Grevillea **4**: 16. 1875.

Nectria aureofulva Cooke & Ellis, Grevillea **7**: 8. 1878.

Nectria depauperata Cooke, Grevillea **7**: 50. 1878.

Nectria vulgaris Speg. Anal. Soc. Ci. Arg. **12**: 75. 1881.

Verticillium tubercularioide Speg. Anal. Soc. Ci. Arg. **12**: 125. 1881.

? *Nectria rhizogena* Grevillea **11**: 108. 1883.

Nectria pallida Ellis & Everh. Proc. Phil. Acad. Nat. Sci. **1894**: 325. 1894.

Stromata small, tubercular, 1–2 mm. in diameter, whitish to pink or flesh-colored, often floccose with the erect verticillate conidiophores; branches of the conidiophores ascending perpendicularly and each bearing at its summit a single conidium; conidia elliptical, hyaline, 5–8 × 3 mic. often granular within; perithecia occurring in dense clusters ranging from 3–5 to many perithecia, clusters very variable in form; individual perithecia small, nearly globose with the prominent papilliform ostiolum, smooth or only minutely rough, at first flesh-colored, when dry becoming pale yellow or almost white, 200–300 mic. in diameter, entire or occasionally collapsing becoming pezizoid; asci clavate, 8-spored, 50 × 5–7 mic.; spores 2-seriate above, 1-seriate below or often irregularly crowded, fusoid with ends acute, a little constricted at the septum, hyaline, 8–12 × 3–4 mic.

On bark of various kinds of trees, *Andromeda, Betula, Carpinus, Carya, Clethra, Citrus, Laurus, Magnolia, Platanus, Salix,* also on *Yucca* and old stump of *Musa.*

TYPE LOCALITY: Pennsylvania.

DISTRIBUTION: New York to Missouri and Louisiana.

EXSICCATI: Ellis, N. Am. Fungi, *677, 574.* Ravenel, Fungi Am. Exsicc. *645.* Other specimens examined: Delaware, *Commons;* Missouri, *Demetrio* (type of *N. pallida* Ellis & Everh.); New York, *Seaver, Shear;* Pennsylvania, *Schweinitz* (type of *Sphaeria ochroleuca* Schw.); also cotype of *N. aureofulva* Cooke & Ellis, specimens of *N. depauperata* determined by M. C. Cooke, and specimens of *N. vulgaris* Speg. and *Verticillium tuberculariоide* Speg. both from the herbarium of Spegazzini.

The species seems to be very common in the east and south and has been collected by the writer on several kinds of trees and shrubs about New York City. The perithecial clusters are quite variable in size and form and the perithecia themselves variable in color but the species may usually be recognized by the pale perithecia and small, fusoid spores.

13. **Creonectria seminicola** (Seaver)

Nectria seminicola Seaver, Mycologia 1: 21. 1909.

Conidial phase consisting of white mycelial growth covering the substratum, finally heaping up at various points forming pinkish stromata; conidiophores erect, much branched with branches ascending perpendicularly, each bearing at its summit a single elliptical, hyaline, conidium; conidia 5–7 × 2–3 mic., with 1–2 oil-

drops; perithecia cespitose in dense clusters with the clusters often becoming confluent and covering the most of the exposed surface of the substratum; individual perithecia nearly globose with a minute papilliform ostiolum, smooth or nearly so, 250 mic. in diameter, at first flesh-colored to orange, fading in drying to pale yellow or whitish; asci clavate, 40–50 mic. long, 8-spored; spores mostly 2-seriate or irregularly crowded, hyaline, 1-septate, a little constricted at the septum, 10–14 × 3–3.5 mic. (*pl. 13, f. 5–7*).

On partially decayed seeds of skunk cabbage, *Spathyema foetida* and also on seeds of cultivated beans which are partially decayed.

TYPE LOCALITY: New York City.

DISTRIBUTION: Known only from type locality.

ILLUSTRATIONS: Mycologia **1**: *pl. 2, f. 5–9.*

SPECIMENS EXAMINED: New York, *Seaver* (type).

The perithecial and spore characters of this species are identical with those of the preceding with which specimens were carefully compared before describing the species originally. Since describing the present species other information gained in the field has suggested that possibly the two are identical. Attempts to prove the identity of the two species by culture have failed.

14. **Creonectria gramnicospora** (Ferd. & Wge.)

Nectria grammicospora Ferd. & Wge. Bot. Tidsskrift **29**: 11. 1908.

Stromata pulvinate, erumpent; perithecia cespitose, clusters variable in size; individual perithecia subglobose, 300–350 × 200–250 mic. in diameter, fleshy-membranaceous, pallid-ochraceous, slightly white furfuraceous near the base; asci clavate, above truncate, subsessile, 35–60 × 8.5–10 mic., 8-spored; spores 2-seriate above, 1-seriate below, ellipsoid, slightly unequal-sided, 12–14 × 5 mic.

On bark of branches.

TYPE LOCALITY: Island of St. Thomas.

DISTRIBUTION: Known only from type locality.

ILLUSTRATIONS: Bot. Tidssk. **29**: *pl. 1, f. 3.*

SPECIMENS EXAMINED: St. Thomas, Raunkier *3103* (cotype).

Similar in general appearance to the two preceding species but spores larger with some differences in size of perithecia and other gross characters.

15. **Creonectria tuberculariformis** (Rehm)

Hypocrea tuberculariformis Rehm, Ber. Naturh. Ver. Augsburg **26**: 106. 1881.

Nectria tuberculariformis Winter; Rabenh. Krypt. Fl. **1**²: 118. 1887.

Hypocreopsis tuberculariformis Sacc. Syll. Fung. **9**: 981. 1891.

Stroma tubercular, rounded or more often elongated, nearly smooth or in dried specimens often longitudinally striated, pinkish or rose-colored becoming dull red with age; perithecia superficial, solitary or more or less crowded, small, averaging about 200 mic. in diameter, smooth or nearly so, globose with a rather prominent papilliform ostiolum becoming slightly collapsed from above when dry; asci clavate, 8-spored, 40–50 × 6–7 mic.; spores 1–2-seriate, mostly 2-seriate above and 1-seriate below, usually a little broader above, fusoid, 1-septate and a little constricted at the septum, with small oil-drops in each cell, 8–11 × 3–4 mic. (*pl. 13, f. 8–10*).

On dead stems of *Urtica* sp., more rarely on old branches and dung.

TYPE LOCALITY: Germany.

DISTRIBUTION: N. Dakota.

SPECIMENS EXAMINED: N. Dakota, *Seaver* (various collections); also Rehm, Ascomycetes, *435, 679* (including cotype).

The conidial phase of this fungus was collected commonly in North Dakota but the mature perithecia were less common. The species is very different in the arrangement of the perithecia from any of the other species of the genus.

DOUBTFUL SPECIES

Nectria muscivora (Berk. & Br.) Cooke, Handbk. Brit. Fungi **2**: 786. 1871.

Sphaeria muscivora Berk. & Br. Ann. Mag. Nat. Hist. **6**: 188. 1851. *Calonectria muscivora* Sacc. Michelia **1**: 315. 1878.

"Mycelium forming white, lanose patches 2 inches or more in diameter and rapidly destroying the moss on which it grows. Perithecia collected in little groups more or less connate, half immersed in the mycelium, bright orange, ovate, sometimes collapsing laterally, orifice papillaeform. Asci clavate; sporidia elliptical, pointed at either end, with a central septum, and the endochrome in either articulation bipartite, so that they are probably three-septate when the sporidia are quite mature."

Specimens distributed in Ravenel's Fungi Car Exsic. 57 and Ellis' N. Am. Fungi 1333, both of which have been incorrectly referred to this name, are apparently good specimens of *Sphaerostilbe coccophila* (Desm.) Tul. The type of the present species has not been seen.

Nectria infusaria Cooke & Hark. Grevillea **12**: 101. 1884.

Stroma (*Fusarium*) pulvinate, pale red; conidia curved, 3-septate, hyaline, 30–40 × 2.5 mic.; perithecia cespitose, erumpent, pallid-red, few in number, soft-membranaceous, subconfluent, smooth, 5–10 on a stroma; asci cylindrical, 8-spored; spores 1-seriate, elliptical, 1-septate, not constricted, hyaline, 10 × 4–5 mic.

On *Acacia* twigs, California. No specimen has been seen.

Nectria Ipomoeae Halst. Rep. N. Jersey Agric. Exp. Sta. **12**: 281. 1891.

Conidial phase consisting of a *Fusarium;* perithecia cespitose, globose-conical, verrucose-squamulose, red; asci clavate, 8-spored; spores elliptical, 1-septate, slightly constricted, hyaline.

On roots and stems of eggplant.

A note from Mr. Halsted states that the type of this species was probably destroyed. The species seems to be well characterized although no specimens in good condition have been available for examination.

Nectria Bainii Massee, Bull. Royal Gardens Kew **1899**: 5. 1901.

Perithecia gregarious, seated on a yellowish-red or orange-colored mycelium, globose, red, hairy, finally naked above, 300–350 mic. in diameter; asci clavate-cylindrical, shortly stipitate, 8-spored, 80–90 × 7–9 mic.; spores partially 2-seriate, oblong-elliptical or subacute, 1-septate, 10–12 × 5 mic., hyaline.

Parasitic on cacao pods, Trinidad.

A cotype specimen of this species from Kew is too minute to permit fair examination.

Nectria ditissima Tul. Fung. Carp. **3**: 73. 1865.

American specimens referred to this name do not differ so far as we can see from *Nectria coccinea* (Pers.) Fries.

Nectria citisporina Ellis & Everh. Erythea **1**: 197. 1893.

Nectria microspora Cooke & Ellis, Grevillea **5**: 53. 1876.

17. **Macbridella** gen. nov.

Perithecia in dense cespitose clusters seated on a stroma, bright colored, reddish or yellowish, becoming darker with age, globose to subcylindrical, collapsing or entire; asci cylindrical-clavate, 8-spored; spores elliptical or fusoid, 1-septate, at first hyaline, becoming smoky-brown to brownish-black.

Type species: *Nectria chaetostroma* Ellis & Macbr.

Distinguished from *Creonectria* by the colored spores. The subgeneric name *Phaeonectria* was proposed by Saccardo and based on one of the species here described. Since both of the North American species included in this genus were collected on a botanical expedition sent out from the State University of Iowa, both were originally described in the Bulletin of the Laboratories of Natural History of that Institution, and the type of the genus bears the name of Professor T. H. Macbride as its coauthor, it seems appropriate that the genus should be named in his honor.

Spores small, 18–20 × 7–8.5 mic.; perithecia surrounded with hairs. 1. *M. chaetostroma.*

Spores large, 35–48 × 10–12 mic.; perithecia not surrounded with hairs. 2. *M. striispora*

1. **Macbridella chaetostroma** (Ellis & Macbr.)

Nectria chaetostroma Ellis & Macbr.; Ellis & Everh.; Bull. Lab. Nat. Hist. St. Univ. Iowa **4**: 70. 1896.

Perithecia in dense irregular clusters 1–5 mm. in diameter, clusters often elongated; individual perithecia globose or subglobose, dark reddish-brown, becoming brownish-black, slightly collapsing becoming pezizoid, surrounded at the base with a growth of brown, crooked, septate hairs, 100–200 mic. long and 3–4 mic. thick; asci clavate, 75–80 × 10 mic., 8-spored; spores 2-seriate or rather irregularly crowded in the ascus, elliptical, straight or curved, 1-septate, slightly constricted, with a distinct oil-drop in each cell, pale brown, 18–20 × 7–8.5 mic.; paraphyses filiform.

On bark of undetermined tree or shrub.

TYPE LOCALITY: Central America.

DISTRIBUTION: Known only from type locality.

EXSICCATI: C. L. Smith, Nicaragua Fungi, *206* (cotype).

"The first appearance is a tuft of dark brown hairs, which are finally hidden and almost obliterated by the densely crowded perithecia 10–40 in number in a compact group 1–4 mm. across."

2. **Macbridella striispora** (Ellis & Everh.)

Nectria striispora, Ellis & Everh. Bull. Lab. Nat. Hist. St. Univ. Iowa **2**: 398. 1893.

Perithecia in irregular, dense, cespitose clusters as large as 5 mm. in diameter, consisting of 20–100 perithecia each; individual perithecia subcylindrical, tapering above into an obtuse ostiolum which in mature specimens is quite prominent, at first covered with a yellowish furfuraceous coat, finally amber; asci clavate, tapering above, about 100 × 15 mic., 8-spored; spores crowded in the ascus, large, fusoid, straight or curved, 1-septate, with several large oil-drops in each cell, slightly constricted at the septum, pale brown, becoming striated, 35–48 × 10–12 mic.; paraphyses indistinct.

On bark and rotten wood.

TYPE LOCALITY: Central America.

DISTRIBUTION: Known only from type locality.

EXSICCATI: C. L. Smith, Central Am. Fungi, *6*.

The spores in this species resemble in size and color the teleutospores in some of the common rusts. The striations are quite prominent but do not appear to roughen the outer surface but to be due to some internal markings or contents.

18. GIBBERELLA Sacc. Michelia **1**: 43 (in note). 1879

Stromata (*Fusarium*) tubercular or more or less effuse; perithecia cespitose or occasionally scattered on or surrounding the stromata; asci clavate, 8-spored, spores fusoid; 3–many-septate, hyaline.

Type species: *Sphaeria pulicaris* Fries.

1. GIBBERELLA PULICARIS (Fries); Sacc. Michelia **1**: 43 (in note). 1879

Sphaeria pulicaris Fries; Kunze & Schm. Myk. Hefte **2**: 37. 1823.

Gibbera pulicaris Fries, Summa Veg. Scand. 402. 1849.

Botryosphaeria pulicaris Ces. & Not. Comm. Soc. Critt. It. **1**: 212. 1863.

Perithecia in cespitose clusters .5–1 mm. in diameter, seated on a stroma or occasionally more or less scattered around it, ovate with a rather prominent ostiolum, minutely rough, finally collapsing, black to the unaided eye, blue with transmitted light; asci

clavate, tapering above, 8-spored, 50–55 × 10 mic.; spores crowded in the ascus, fusiform, straight or curved, 3-septate, hyaline or slightly yellowish, 18–20 × 5–6 mic.

On corn stalks, herbaceous stems and bark of trees and shrubs.

TYPE LOCALITY: Europe.

DISTRIBUTION: New Jersey to N. Dakota, Kansas and W. Virginia.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 13, f. 1–6;* E. & P. Nat. Pfl. Fam. *f. 240,* G–J.

EXSICCATI: Ellis, N. Am. Fungi, *81;* Wilson & Seaver, Ascom. & Lower Fungi, *32.* Other specimens examined: N. Jersey, *Ellis, Commons;* W. Virginia, *Nuttall;* Iowa, *Seaver;* N. Dakota, *Seaver.*

DOUBTFUL SPECIES

Gibberella Saubinetii (Durien & Mont.) Sacc. Michelia 1: 513. *Sphaeria Saubinetii* Durien & Mont.; Durien; U. Alger. Crypt. 1: 479. 1846? *Gibbera Saubinetii* Mont. Syll. Crypt. 252. 1856.

Gibberella ficini (Cooke & Hark.) Ellis & Everh. N. Am. Pyrenom. 120. 1892.

19. **Scoleconectria** gen. nov.

Ophionectria Sacc. (in part).

Stroma subglobose, tubercular or depressed; perithecia superficial on or surrounding the stroma, in dense clusters or more or less evenly scattered; asci 2–8-spored, cylindrical to clavate; spores 3–many-septate, fusoid to subfiliform, hyaline, or subhyaline.

Type species: *Ophionectria scolecospora* Bref.

Distinguished from *Creonectria* by the many-septate spores and from *Ophionectria* by the presence of a stroma. Characterized by its worm-like spores.

Spores filiform or subfiliform, very long.
- On dead branches of *Pinus;* spores 40–50 × 2.5–3 mic. — 1. *S. scolecospora.*
- On scale insects; spores clavate, 100–120 × 6–7 mic. — 2. *S. coccicola.*

Spores fusoid or subelliptical, comparatively short.
- Stroma prominent, tubercular, 1–2 mm. high. — 3. *S. canadensis.*
- Stroma depressed, inconspicuous.
  - Spores subelliptical, curved. — 4. *S. polythalama.*

Spores fusiform or subfusiform.
Perithecia red; ascospores accompanied by smaller spore-like bodies. 5. *S. balsamea.*
Perithecia yellowish to brownish; spore-like bodies absent. 6. *S. Atkinsonii.*

1. **Scoleconectria scolecospora** (Bref.)

? *Nectria cylindrospora* Sollm. Bot. Zeit. **22**: 265. 1864.
Ophionectria scolecospora Bref. Unters. Myk. **10**: 178. 1891.
Chilonectria Cucurbitula Ellis & Everh. N. Am. Pyrenom. 116. 1892.

Perithecial clusters quite regular, rounded, composed of numerous, densely cespitose perithecia; individual perithecia dull red at first slightly furfuraceous, becoming quite smooth, nearly globose, finally collapsing becoming pezizoid; asci clavate to cylindrical, 60–75 × 8–10 mic., filled with numerous spore-like bodies, often obscuring the long cylindrical spores; spores usually more or less curved, many-septate with the septa transverse or extending irregularly, delicate, 40–50 × 2.5–3 mic.

On branches of different species of *Pinus*.

TYPE LOCALITY: Germany.

DISTRIBUTION: New Jersey.

ILLUSTRATIONS: Brefeld, Unters. Myk. **10**: *pl. 5, f. 45;* Ellis & Everh. N. Am. Pyrenom. *pl. 12, f. 9–12;* E. & P. Nat. Pfl. Fam. 1^1: *f. 241,* D.

EXSICCATI: Ellis & Everh. N. Am. Fungi, *1551.*

Distinguished by the long cylindrical spores with the accompanying minute spore-like bodies. The species cannot be distinguished on gross characters.

No type specimen of this species has been examined but the description and illustration by Brefeld leave little doubt as to its identity. The species has been confused with other species occurring on the same habitat and with similar gross characters.

2. **Scoleconectria coccicola** (Ellis & Everh.)

Nectria coccicola Ellis & Everh. Jour. Myc. **2**: 39. 1886.
Dialonectria coccicola Ellis & Everh. Jour. Myc. **2**: 137. 1886.
Ophionectria coccicola Berl. & Vog.; Sacc. Syll. Add. **4**: 218. 1886.

Stroma rounded, more or less prominent, whitish; conidia borne in clusters of 3–5, large, broad at the base, tapering into a bristle-like apex, 15–20-septate, 100–150 × 7–7.5 mic. with a distinct stem-like base; perithecia in cespitose clusters, nearly globose or a little longer than broad, reddish becoming dark brownish, minutely roughened, at first clothed with a few hyaline hairs, then naked, 300–500 mic. in diameter; asci cylindrical, tapering below into a stem-like base, 150–200 × 20 mic.; spores clavate or subcylindrical, 100–120 × 6–7 mic. at the base, 15–20-septate, hyaline.

On dead scale insects on the bark of living orange trees.

TYPE LOCALITY: Florida.

DISTRIBUTION: Florida and Cuba.

ILLUSTRATIONS: Bull. Fl. Agric. Exp. Sta. **94**: 12, *f. 8–14.*

SPECIMENS EXAMINED: Florida, *Southworth* (type).

The conidia of this species resemble very closely both in size and form the ascospores but are much more acutely pointed and may also be distinguished by the manner in which they are borne.

3. **Scoleconectria canadensis** (Ellis & Everh.)

Nectria canadensis Ellis & Everh. Bull. Torrey Club **11**: 74. 1884.

Caloneetria canadensis Berl. & Vog.; Sacc. Syll. Fung. Add. 212. 1886.

Stroma (*Tubercularia*) 1–2 mm. high, with an orange head and dull red base; conidia minute, elliptical, hyaline, about 5 × 2 mic.; perithecia springing in dense clusters from the base of the stroma, finally surrounding and often covering it; individual perithecia nearly globose, brick-red, 250–300 mic. in diameter, at first tubercular and rough finally becoming more or less smooth and slightly collapsing; asci clavate, 75–100 × 12–15 mic., 8-spored; spores crowded, elliptical, straight or curved, hyaline, 3-septate, 18–20 × 7 mic. (*pl. 13, f. 13–14*).

On the bark of *Ulmus* sp.

TYPE LOCALITY: Ontario, Canada.

DISTRIBUTION: Reported only from type locality.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 13, f. 7–14.*

EXSICCATI: Ellis & Everh. N. Am. Fungi, *2547;* Ellis & Everh. Fungi Columbiani, *226.* Other specimens examined: Ontario, Canada, *Dearness,* various collections.

The species is distinct in its prominent stroma.

4. **Scoleconectria polythalama** (Berk.)

Nectria polythalama Berk.; Hooker's Fl. N. Zealand **2**: 203. 1853.

Nectria auriger Berk. & Rav. Grevillea **4**: 46. 1875.

Calonectria polythalama Sacc. Michelia **1**: 308. 1878.

Perithecia erumpent in dense clusters 1–2 mm. long and about 1 mm. broad; seated on a yellowish stroma; individual perithecia subglobose, at first covered with a yellowish-green coat of powdery material which finally disappears leaving the perithecia of a dull red color, finally collapsing; asci cylindrical or clavate, 50–60 × 12–15 mic., 8-spored; spores crowded, elliptical, curved, yellowish-hyaline, 7-septate (mostly), 18–22 × 5 mic.

On *Chionanthus, Fraxinus* and *Liquidambar.*

TYPE LOCALITY: New Zealand.

DISTRIBUTION: Virginia to Alabama.

ILLUSTRATIONS: Brekeley, Hooker's Fl. N. Zealand **2**: *pl. 116, f. 15.*

EXSICCATI: Ellis, Fungi Nova Caesareenses, *69;* Ellis, N. Am. Fungi, *79;* Ravenel, Fungi Car. Exsicc. *54, 60.* Other specimens examined: Virginia, *Commons.*

The perithecia are greenish in some specimens and reddish in others, the difference in color being due to the presence or absence of the greenish powdery material with which the perithecia are clothed. This difference in color seems to have been the distinguishing character of the two species, *N. polythalama* Berk. and *N. auriger* Berk. & Rav.

5. **Scoleconectria balsamea** (Cooke & Peck)

Nectria balsamea Cooke & Peck, Ann. Rep. N. Y. State Mus. **26**: 84. 1874. Grevillea **12**: 81. 1884.

? *Calonectria Cucurbitula* Sacc. Michelia **1**: 312. 1878.

Calonectria balsamea Sacc. Syll. Fung. **9**: 986. 1891.

Perithecial clusters small, 1–2 mm. in diameter, erumpent through the outer bark; individual perithecia nearly globose smooth or only minutely rough, red; in dried specimens dull brick-red, entirely collapsing, becoming pezizoid; asci cylindrical to clavate, at first filled with numerous minute, spore-like bodies about 2 × 1 mic. among which are several (2–4) true spores; spores fusiform, 5–6-septate, granular within, 15–25 × 4–5 mic.

On the branches of *Abies balsamea*.

TYPE LOCALITY: North Elba, New York.

DISTRIBUTION: New York to Minnesota and Newfoundland.

SPECIMENS EXAMINED: Minnesota, *Arthur, Bailey & Holway;* Newfoundland, *Waghorne;* New York, *Peck.*

Distinguished by the fusiform, many-septate spores.

On gross characters the species cannot be distinguished from *Scoleconectria scolecospora* (Bref.) Seaver, however the habitat of the two species is different and this so far as our observations have gone is constant. The spore characters of the two species are very different.

From the presence of the minute spore-like bodies which often obscure the true ascospores this species is also likely to be confused with *Nectria Coryli* Fuckel.

Chilonectria Rosellinii (Carest.) Sacc. may also be identical with this species but in the absence of specimens it is impossible to determine.

6. **Scoleconectria Atkinsonii** (Rehm)

Calonectria Atkinsonii Rehm, Ann. Myc. **2**: 178. 1904.

Perithecia erumpent in dense clusters 1–2 mm. in diameter; individual perithecia subconical, tapering into a prominent obtuse ostiolum, at first densely yellow-furfuraceous with the ostiolum bare and darker-colored, finally becoming bare and dark brownish-black; asci clavate with a subtruncate apex and slender stem-like base, 90–100 × 15–17 mic., 8-spored; spores fusoid or subfusiform, at first 1-septate becoming 3-septate and constricted at the middle septum, mostly curved, hyaline or subhyaline, 27–33 × 8–9 mic.; paraphyses filiform, 3 mic. in diameter.

On dead branches of *Acer, Crataegus, Tilia,* etc.

TYPE LOCALITY: New York.

DISTRIBUTION: New York to Ontario, Canada.

EXSICCATI: Ellis & Everh. Fungi Columbiani, *2006* (as *Calonectria chlorinella* (Cooke) Ellis & Everh.). Other specimens examined: New York, *Atkinson 5240* (cotype), *Cooke;* Ontario, Canada, *Dearness.*

The species was described by Ellis & Everh. N. Am. Pyrenom. *113* as *Calonectria chlorinella* (Cooke) Ellis & Everh., with which species it has often been confused.

20. ECHINODOTHIS Atk.; Bull. Torrey Club **21**: 224. 1894

Stroma subfleshy or corky, light colored, pulvinate to subglobose or irregular in form, often constricted at the base, sometimes entirely surrounding the host, consisting or several layers of different consistency; perithecia superficial, scattered, subcylindrical, sessile, giving an echinulate appearance to the stroma; asci cylindrical, 8-spored; spores linear, septate, at length separating at the septa into short segments.

Type species: *Hypocrea tuberiformis* Berk. & Rav.

1. ECHINODOTHIS TUBERIFORMIS (Berk. & Rav.) Atk. Bull. Torrey Club **21**: 224. 1894

Hypocrea tuberiformis Berk. & Rav. Grev. **4**: 13. 1875.

Dussiella tuberiformis Patouillard, Soc. Myc. France **6**: 107 (in part). 1890.

Hypocrella tuberiformis Atkinson, Bot. Gaz. **16**: 282. 1891.

Stroma subglobose, 1 cm. or more in diameter, entire, lobed or divided, seated upon the reed or upon the leaf sheath and fastened by a whitish mycelium consisting of radiating threads which are sometimes tinged yellowish brown; substance leathery or corky, consisting of three layers, an inner layer white to pinkish, an intermediate layer light ochre and an outer layer cinnamon; stroma externally dark brownish becoming black; conidiophores needle-shaped; conidia oval to fusoid, 3–4 × 7–10 mic.; perithecia entirely superficial in small clusters or evenly distributed over the exposed surface of the stroma; subconical in form, giving the whole stroma a spiny appearance; clothed except the apex with a dense covering of minute threads which are at first whitish becoming cinnamon-colored, the naked apex becoming black, about .3 × 1 mm.; asci 8-spored cylindrical, with a swelling at the apex, very large, 475–750 × 14–20 mic.; spores nearly as long as the ascus, hyaline or slightly yellowish, many-septate, joints 15 × 4–5 mic. (*pl. 13, f. 15*).

On stems of *Arundinaria*.

TYPE LOCALITY: South Carolina.

DISTRIBUTION: South Carolina to Alabama.

ILLUSTRATIONS: Atkinson, Bot. Gaz. **16**: *pl. 25*.

EXSICCATI: Ravenel, Fungi Am. Exsicc. *733*. Other specimens examined: Alabama, *Atkinson 2218;* South Carolina, *Ravenel 619*.

The first description of this species was evidently drawn from

sterile specimens which probably accounts for its having been placed in the genus *Hypocrea*. A note from Kew made from examination of Berkeley and Ravenel's specimen No. 1220 states "no spores visible." Small cavities beneath the surface of the stroma were evidently mistaken for the perithecia. This is the number from which the description was drawn in Grevillea **4**: 13.

Other specimens examined from the Ravenel collection show mature perithecia. The spore characters suggest *Hypocrella* or *Epichloe* but the superficial position of the perithecia bar it from either of those genera in both of which the perithecia are entirely immersed or with the necks slightly protruding.

21. THYRONECTRIA Sacc. Grevillea **4**: 21. 1875

Pleonectria Sacc. Nuov. Giorn. Bot. It. **8**: 178. 1876.

Stroma erumpent-superficial or subimmersed with the perithecia in dense cespitose clusters; individual perithecia subglobose, smooth or rough or often clothed with a yellowish-green, furfuraceous coat which sometimes disappears with age leaving the perithecia dark colored, red to brownish, collapsing or entire; asci 8-spored, cylindrical to clavate; spores hyaline, when mature many-septate and muriform, often accompanied by minute spore-like bodies which are much smaller in size.

Type species: *Thyronectria Patavina* Sacc.

Distinguished by the muriform, hyaline spores.

Spores elliptical, 2 times as long as broad.
- Perithecia subimmersed, greenish. — 1. *T. pyrrhochlora.*
- Perithecia erumpent-superficial, not green.
  - Perithecia dark brownish; spores small, 10–15 × 7–9 mic. — 2. *T. denigrata.*
  - Perithecia reddish; spores large, 16–30 mic. long.
    - Spores 20–30 × 10–12 mic., on bark of *Carya*. — 3. *T. missouriensis.*
    - Spores 16–20 × 7–8 mic., on *Ribes*. — 4. *T. berolinensis.*

Spores subelliptical, accompanied by minute spore-like bodies. — 5. *T. sphaerospora.*

1. THYRONECTRIA PYRRHOCHLORA (Auers.) Sacc. Michelia **1**: 325. 1878

Nectria pyrrhochlora Auers. Hedwigia **8**: 88. 1869.

Valsa Xanthoxyli Peck, Ann. Rep. N. Y. St. Mus. **31**: 49. 1879.

Pseudovalia xanthoxyli Sacc. Syll. Fung. **2**: 137. 1883.

Fenestella Xanthoxyli Sacc. Syll. Fung. **2**: 332. 1883.

Pleonectria pyrrhochlora Winter; Rabenh. Krypt. Fl. 1^2: 108. 1887.

Thyronectria virens Hark.; Ellis & Everh. N. Am. Pyrenom. 92. 1892.

Thyronectria Xanthoxyli Ellis & Everh. N. Am. Pyrenom. 92. 1892.

Perithecia cespitose in rounded or elongated clusters, seated on the inner bark, finally bursting through the epidermis, becoming more or less superficial, often so densely cespitose that the perithecia appear to be united, at first covered with a thin olive-green tomentum, or powdery material, with the ostiolum protruding and bare, the entire perithecium becoming more or less bare with age, about 300 mic. in diameter; asci clavate, 100–125 mic. long, 8-spored; spores crowded, elliptical, straight or curved, hyaline or slightly yellowish, many-septate and muriform, 18–24 × 7–8 mic.

On branches of *Acer, Fraxinus* and *Xanthoxylum.*

TYPE LOCALITY: Europe.

DISTRIBUTION: New York to Ontario and Ohio.

EXSICCATI: Ellis & Everh. N. Am. Fungi, *2546, 3310.* Other specimens examined: Ohio, *Morgan;* Ontario, *Dearness 1484.*

2. **Thyronectria denigrata** (Winter)

Pleonectria denigrata Winter, Bull. Torrey Club **10**: 49. 1883.

Perithecia erumpent in very dense, large, rounded clusters 2–5 mm. in diameter, seated on a brownish stroma; individual perithecia nearly globose, minutely roughened, dark brownish with a prominent, black, shining ostiolum finally becoming black, 350–450 mic. in diameter; asci cylindrical, 50–70 × 8–10 mic., 8-spored; spores 1-seriate or crowded, short elliptical, hyaline or slightly yellowish, 3–5-septate, becoming muriform, often a little constricted, 10–15 × 7–9 mic.

On branches of *Gleditschia triacanthos.*

TYPE LOCALITY: Lexington, Kentucky.

DISTRIBUTION: Delaware to Kansas and Kentucky.

EXSICCATI: Ellis, N. Am. Fungi, *1334;* Ellis & Everh. N. Am. Fungi, *2372.* Other specimens examined: Delaware, *Commons;* Kansas, *Bartholomew;* Kentucky, *Kellerman;* Missouri, *Webber;* Ohio, *Morgan.*

3. **Thyronectria missouriensis** (Ellis & Everh.)

Nectria missouriensis Ellis & Everh. Jour. Myc. **4**: 57. 1888.
Pleonectria missouriensis Sacc. Syll. Fung. **9**: 990. 1891.
Paronectria missouriensis Rabenhorst-Winter, Fungi Europaei, *3748*. 1891.

Perithecia cespitose on the stroma in clusters of 6–20, dull red, nearly globose, smooth or minutely rough, with a prominent ostiolum, usually not collapsing, 250–300 mic. in diameter; asci clavate, 100–120 × 12–15 mic., 8-spored; spores crowded irregularly in the ascus, large, elliptical, straight or a little curved, hyaline or very slightly yellowish, 6–7-septate, with several longitudinal septa, dividing the spore into numerous small cells, 20–30 × 10–12 mic.

On bark of *Carya*.

TYPE LOCALITY: Concordia, Missouri.

DISTRIBUTION: Delaware to Missouri.

SPECIMENS EXAMINED: Missouri, *Demetrio 276*.

Distinguished from *T. berolinensis* (Sacc.) Seaver by the larger size of the spores as well as by the difference in host and a slight variation in perithecial characters.

4. **Thyronectria berolinensis** (Sacc.)

Nectria Ribis Niessl, Verh. Nat. Ver. Brumm **2**: 114 (homonym). 1865.
Pleonectria berolinensis Sacc. Michelia **1**: 123. 1878.
Pleonectria Ribis Karst. Medd. Soc. Fauna Fl. Fenn. **5**: 42. 1879.

Perithecia erumpent in large cespitose clusters 1–3 mm. in diameter on a stroma which becomes indistinct in aged specimens; individual perithecia dull brick-red becoming darker with age and often quite black, smooth or nearly so, entirely collapsing becoming pezizoid with age, 250–300 mic. in diameter; asci cylindrical-clavate, 8-spored; spores 1-seriate, elliptical, 5–9-septate and muriform, hyaline or very slightly yellowish, 16–20 × 7–8 mic.

On dead branches of *Ribes* (wild and cultivated).

TYPE LOCALITY: Germany.

DISTRIBUTION: Massachusetts to Montana.

ILLUSTRATIONS: Ellis & Everh. N. Am. Pyrenom. *pl. 12, f. 7–8*.

EXSICCATI: *Ellis,* N. Am. Fungi, *470;* Ellis & Everh. Fungi

Columbiani, *26, 470.* Other specimens examined: Montana, *Anderson 396;* Iowa, *Holway;* Massachusetts, *Farlow;* N. Dakota, *Seaver* (various collections).

5. **Thyronectria sphaerospora** (Ellis & Everh.)

Nectria sphaerospora Ellis & Everh.; Bessey & Webber, Ann. Rep. Neb. St. Board Agric. **1889**: 193. 1890.

Chilonectria crinigera Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1890**: 246. 1891.

Perithecia cespitose on a tubercular stroma in small clusters of 3–12 each; individual perithecia subglobose, papillate, minutely rough, at first covered with a brownish furfuraceous coat, finally bare and nearly black, slightly collapsing or entire, about 300–400 mic. in diameter; asci clavate, about 50–70 × 12–15 mic. at first filled with numerous minute spore-like bodies 2–3 × 1 mic., among which are the true spores, 8 in each ascus; ascospores subglobose, mostly 1-seriate, becoming about 3-septate and muriform, 5–8 mic. in diameter, surrounded by numerous spore-like bodies which appear like minute appendages.

On bark of *Fraxinus* and *Gleditschia.*

TYPE LOCALITY: Lincoln, Nebraska.

DISTRIBUTION: Known only from type locality.

SPECIMENS EXAMINED: Nebraska, *Webber* (type).

22. **Thyronectroidea** gen. nov.

Perithecia cespitose in erumpent clusters as in *Thyronectria;* asci clavate-cylindrical, 8-spored; spores elliptical, many-septate, becoming muriform, at first hyaline, becoming dark brown.

Type species: *Thyronectria chrysogramma* Ellis & Everh.

Distinguished from *Thyronectria* by the colored spores.

1. **Thyronectroidea chrysogramma** (Ellis & Everh.)

Thyronectria chrysogramma Ellis & Everh. Proc. Acad. Nat. Sci. Phil. **1890**: 245. 1891.

Mattirolia chrysogramma Sacc. Syll. Fung. **9**: 993. 1891.

Perithecia springing from below the epidermis in dense cespitose clusters of 3–6 perithecia each; individual perithecia ovate, .25–.5 mm. in diameter, clothed with a greenish-yellow coat with the ostiolum bare and black; asci clavate-cylindrical, 150–175 × 14–18 mic., 8-spored; spores 2-seriate, elliptical, mostly a little

curved, 7–10-septate, with very faint, interrupted, longitudinal septa, at first hyaline, becoming quite dark brown, 25–35 × 10–12 mic.; paraphyses abundant.

On bark of *Ulmus americana.*

TYPE LOCALITY: Manhattan, Kansas.

DISTRIBUTION: Kansas to Ontario and New York.

SPECIMENS EXAMINED: Ohio, *Morgan;* Ontario, Canada, *Dearness.*

NEW YORK BOTANICAL GARDEN.

EXPLANATION OF PLATE XIII.

1. *Megalonectria pseudotrichia* (Schw.) Speg., × 25.
2. *Megalonectria pseudotrichia* (Schw.) Speg., asci and spores, × 400.
3. *Creonectria pithoides* (Ellis & Everh.) Seaver, natural size.
4. *Creonectria pithoides* (Ellis & Everh.) Seaver, × 25.
5. *Creonectria seminicola* Seaver, two thirds natural size.
6. *Creonectria seminicola* Seaver, × 25.
7. *Creonectria seminicola* Seaver, conidiophores, × 400.
8. *Creonectria tuberculariformis* (Rehm) Seaver, natural size.
9. *Creonectria tuberculariformis* (Rehm) Seaver, × 10.
10. *Creonectria tuberculariformis* (Rehm) Seaver, conidiophores, × 400.
11. *Creonectria rubicarpa* (Cooke) Seaver, natural size.
12. *Creonectria rubicarpa* (Cooke) Seaver, × 25.
13. *Scoleconectria canadensis* (Ellis & Everh.) Seaver, × 25.
14. *Scoleconectria canadensis* (Ellis & Everh.) Seaver, asci and spores, × 400.
15. *Echinodothis tuberiformis* (Berk. & Rav.) Atk., × 2.

A NOTABLE SPECIES OF GYMNOSPORANGIUM FROM COLORADO

FRANK D. KERN

While collecting fungi in the vicinity of Trinidad, Colorado, on May 20, 1908, the writer came upon a moderate sized tree of *Sabina monosperma,* affected with what appeared to be some small species of *Gymnosporangium.* The sori were just breaking forth between the scale-like leaves (Fig. 1, *a*) in a very inconspicuous manner much after the style of *G. inconspicuum,* a species recently described by the writer and previously collected only in the vicinity of Glenwood Springs on *Sabina utahensis.* So striking, in fact, was the resemblance to *G. inconspicuum* in general appearance and habit, that there was at first examination not the slightest suspicion that it wonld turn out to be another thing. Thinking that the range of a hitherto little known species would be considerably extended, and another host added, it was with especial delight that a collection was made. It was evident that germination had not yet taken place and a small quantity of material was immediately sent in to the laboratory by mail, to be kept fresh by putting the branches in water, with the hope that some cultures might be made.*

After returning to the laboratory several days later, a microscopical examination was made and it was then learned that the supposition entertained in the field was incorrect, and that a new and distinctive species had been discovered.

The spores of the Trinidad specimen are thick-walled, considerably constricted at the septum, rounded both above and below, and have a pedicel of uniform, relatively small diameter, while those of *G. inconspicuum* are thin-walled, not at all or only slightly constricted, narrowed above, and have a carotiform pedicel of considerable thickness just below the spore.

* It may be recorded here that this was subsequently sown upon *Crataegus* and *Amelanchier* without infection. Although the material seemed to be in good condition, no germination of the spores was observed either in drop cultures or in the sori that were employed for the attempted cultures.

It is, however, in the number and location of the germ pores that the new species is especially notable. It has from five to seven large, scattered pores in each cell (Fig. 1, *b*). No other species of *Gymnosporangium* has ever been observed by the writer with more than two germ pores. A number of species have been reputed to have four in each cell,* but on very careful examination the writer has never been able to verify this assertion. Seven seems to be the usual number in the species under

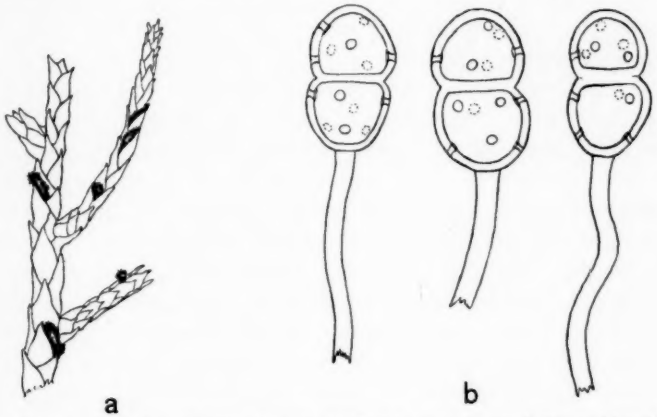


FIG. 2. *a*, Portion of green branch showing manner in which the sori break forth between the scale-like leaves; about three times natural size. *b*, Three teliospores showing outline, uniformly thick walls and size and location of the many pores, × 468.

discussion, although a few were observed where only five or six could be found. The fact that the pores are scattered is also significant. In all other species of the genus they have some definite arrangement, such as, near the septum in both cells, or apical in the upper, and sometimes near the pedicel in the lower cell. It may be further noted here that this character of numerous scattered pores in the teliospores is not only new to the genus *Gymnosporangium* but has never been known in any genus of the family Aecidiaceae, which includes such well-known genera as *Puccinia, Uromyces* and *Phragmidium.*

* See Farlow, Anniv. Mem. Boston Soc. Nat. Hist., The Gymnosporangia or Cedar-apples of the United States, pp. 13, 17, 18, 23. 1880.

The new species may be characterized as follows:

Gymnosporangium multiporum sp. nov.

Teliis inter folia squamosa erumpentibus, irregulariter dispositis, musciformibus, parvis, 0.5–0.8 mm. altis, pallide castaneo-brunneis; teliosporis uniseptatis, ellipsoideis, 20–24 $\mu \times$ 45–51 μ, apice et basi rotundatis, medio constrictis; episporio cinnamomeo-brunneo, 1.5–2.5 mm. crasso; pedicello hyalino, 7–9 μ diam., longissimo; poris germinationis 5–7 sparsis instructis.

In ramulis *Sabinae monospermae* (Engelm.) Rydb. (*Juniperi occidentalis monospermae* Engelm.) Trinidad, Colorado, Maio 20, 1908, *Frank D. Kern.*

In addition to the type collection the writer has received a specimen from Prof. E. Bethel on *Sabina utahensis* (Engelm.) Rydb. (*Juniperus californica utahensis* Engelm.), collected at McCoy, Colo., July 16, 1908. These two localities are rather widely separated but may be taken to indicate that the species is distributed all over the southern and southwestern portion of the state. The fact that both *Sabina monosperma* and *S. utahensis* are hosts is an indication of the similarity between these two cedars. *Gymnosporangium speciosum* also occurs on these two hosts and there is every reason to suppose that a parasite inhabiting one may inhabit the other. No clue as to a possible roestelial connection has yet been obtained either for the new species or for *G. speciosum.*

PURDUE UNIVERSITY,
LAFAYETTE, INDIANA.

A NEW POISONOUS MUSHROOM

William A. Murrill

A most interesting case of mushroom poisoning was recently brought to my attention by Dr. W. C. Deming, of Westchester, who poisoned himself and the members of his family with a small mushroom found growing in the grass at Morris Park. This mushroom does not belong to the class usually considered poisonous, and its properties have never before been tested. This is only another argument in favor of not eating mushrooms of any kind unless they are perfectly well known. The chances in this case were about one in a thousand, but Dr. Deming happened to get the one.

On the very day that the poisoning occurred, I had noticed two small mushrooms growing together in quantity on the lawn in front of the museum building of the New York Botanical Garden. These were carefully studied and the accompanying illustration made of them. The two kinds brought in by Dr. Deming from Morris Park proved to be the same that I had collected and studied here.

The non-poisonous kind, *Panaeolus papilionaceus,* is two or three inches high and one-half to three-quarters of an inch broad, with conical cap and perfectly smooth, smoky-brown upper surface, the lower surface being brownish-black and somewhat grayish-speckled. If the cap is removed and placed on a piece of white paper under a tumbler, the spore-print is black.

The poisonous kind, *Inocybe infida,* is slightly larger, with semiorbicular cap surmounted by a prominent nipple, which is dark reddish-brown, while the rest of the upper surface is light tawny-brown. The upper surface also differs from that of the non-poisonous kind in being silky-scaly and shining. The lower surface differs in being much lighter, pale yellowish instead of brownish-black, and the spore-print is about the color of oak wood. Most of these differences may be seen in the illustration.

The fact that Dr. Deming is a practising physician, as well as a student of fungi, makes his observations in this case exceedingly valuable. Replying to a letter requesting detailed information, Dr. Deming wrote me on June 22 as follows:

"I thank you for your letter and the interest you take in the mushroom incident. I was once vice-president of the N. Y. Mycological Club, about the time when Professor Underwood was its president, and so I should have known better than to break my heretofore carefully observed rule not to eat any

FIG. 3. *Panaeolus papilionaceus* (Bull.).

mushrooms in quantity that I did not know to be perfectly safe. Of the two kinds left with you, the smaller, dark ones I have eaten freely for several years and they are excellent. The other kind I was not familiar with, but it was growing in abundance on the lawn of the Morris Park Club House on June 14.

"I here transcribe notes made on that or the following evening: June 14, '09, about 11:30 A. M., my son and I gathered about a quart of mushrooms, mostly of the unknown variety and some of the variety frequently eaten. No other kind was gathered. These were stewed and served on toast at 1 P. M. I ate only one-half slice with the mushroom thereon, some bread and

butter, two cups of weak tea, a little more than one-half a stuffed egg, with lettuce and mayonnaise dressing.

"Directly after lunch I smoked one half a cigarette as usual. On finishing this, I began to wonder if this or the mushroom had disagreed with me, on account of a slight "queer" feeling which I cannot accurately describe, but it was so little at first that I dismissed it from my mind. In a few minutes, however, I gradually began to get a fullness in the head and a rapid heart action as if I had taken nitroglycerin. Then I began to sweat, with a feeling of heat over the body, so that my clothing was drenched, even my outer clothing requiring changing later. At the same

FIG. 4. *Inocybe infida* (Peck).

time there was no nausea nor prostration nor other bad feeling, and I attended to a man with a wound in my office and then to other members of the family without difficulty, though a little confused in mind perhaps. A little after this, perhaps forty-five minutes after eating the mushrooms, I washed out my stomach with a tube and later took about an ounce of castor oil. Soon after, but long before the oil operated, I had a disagreeable sense of pressure, almost pain, in the lower bowel, accompanied for a little while by slight abdominal soreness or pain. All symptoms gradually subsided and by evening I was as well as ever except for a little feeling of exhaustion.

"My wife, 25 years old, ate one whole slice of toast with mushrooms, two half eggs stuffed, with lettuce and mayonnaise, tea, bread and butter. About half an hour later she felt nauseated and dizzy and lay down. I gave her five glasses of warm water, after which she vomited the egg, but saw no mushrooms. She then took castor oil.

"Mrs. A., 65 years old, ate the same amount of mushrooms, several slices of bread and butter, a cup of tea, but no eggs nor salad. When asked, said she felt slight indigestion, but otherwise well.

"My son, 5 years old, ate same amount, but no eggs nor salad. Immediately after lunch he had a diarrheal movement containing mushrooms. He was given ipecac and warm water and vomited some mushrooms.

"Sophie, maid, aged 30, tasted mushrooms. Felt nauseated soon after. Given mustard and water, but did not vomit. Later, castor oil and was purged and somewhat prostrated. Hattie, maid, aged 38, tasted mushrooms. Belched gas soon after. Not sick. Esther, maid, aged 24, tasted; no effects.

"There was no peculiar taste to the cooked mushrooms, perhaps a very evanescent bitterness in the raw state. I thought perhaps the combination of the eggs and mayonnaise with the mushrooms had something to do with the effects, as my wife and I, the only ones who ate both in any amount, were the chief sufferers. In my case the beating of the heart, full head and sweating were very marked, though I ate but half as much as the others."

It is impossible to tell until a chemical analysis is made just what poison this mushroom contains. It is probably not narcotic, as in the case of the deadly amanita, since the effects appear too quickly. On the other hand, there is nothing in the taste of the mushroom, according to my own experiments with fresh specimens, to suggest an irritating poison. It is altogether likely that this species, belonging as it does to a group quite different from any heretofore recognized as containing poisonous species, will be found to contain a new poison with effects heretofore undescribed.

NEW YORK BOTANICAL GARDEN.

A SPECIES OF DISCOSIA ON LIVING BULL PINE SEEDLINGS

F. D. Heald

(With Plate 14, Containing 7 Figures)

A dozen or more species of *Discosia* are recorded by Saccardo from various parts of the United States. The species of this genus have been found upon the leaves of various herbaceous plants and upon the leaves of deciduous trees. In all cases, they were on languid, dead, dry, or decomposing remains of the host plant. One species has been described from the samaras of *Fraxinus americana*. Two species of the genus have been described from specimens found on coniferous hosts: *Discosia virginiana* Thüm.* on the dead leaves and branches of *Juniperus virginiana*, from Newfield, N. J., and *Discosia strobilina* Lib. on the fallen cones of a species of *Abies* from Arduennis.†

During an examination of the Forest Reserve at Halsey, Nebr., May 17, 1907, in an effort to determine the cause of a troublesome blight of the young pine seedlings, my attention was called by Mr. W. F. Mast to the fungus here described. The species, which is apparently a new one, was found growing upon the *living seedlings* of the bull pine (*Pinus ponderosa*). It has not been determined whether this fungus is in any way connected with the blight that was prevalent. In all cases where the fruiting fungus was found on the seedlings, they did not show any signs of injury, but were apparently in *vigorous condition*.

The seedlings which showed the fruits of the fungus were in the year old beds. The pycnidia are scattered along the hypocotyl slightly above the ground line, and show as minute coal-black specks, easily visible to the naked eye (Fig. 1). The following measurements will give their variation in size: (1), 164 × 310.5 μ; (2), 155 × 241.5 μ; (3), 121 × 241.5 μ; (4), 138 × 362 μ; (5), 121 × 224 μ.

* Saccardo, Syll. Fung. **10**: 427. 1892.
† Saccardo, Syll. Fung. **3**: 656. 1884.

The pycnidia vary in form; the majority are oblong or elliptical, while some are lobed or notched. In all a central ostiole is present (Figs. 2, 3).

The spores are three-septate and either clear or slightly smoky, and each terminal cell bears a straight or slightly curved cilium a little longer than half the length of the spore. In many of the spores the two terminal cells are quite clear, and less granular than the two middle cells. The spores are comparatively uniform in diameter, and nearly straight, with a slight curvature on the side directed away from the cilia. The length varies from 12 to 20 μ but the diameter shows no appreciable variation, never exceeding 2.6 μ (Figs. 4, 5). The detail of the spore formation as represented in cross-sections of the pycnidia shows the spore-bearing branches as straight, unbranched hyphae with spores erect and packed closely together (Fig. 6).

The parenchymatous condition of the pycnidium wall is very apparent in the basal portion but less so in the superficial portion. A characteristic and well-marked feature of the pycnidium is the occurrence of vertical supporting columns of hyaline hyphae which run from the floor of the pycnidium to the roof, and serve to retain the wall of the pycnidium in its original position until the spores have escaped (Fig. 7).

The following technical description of this fungus is appended:

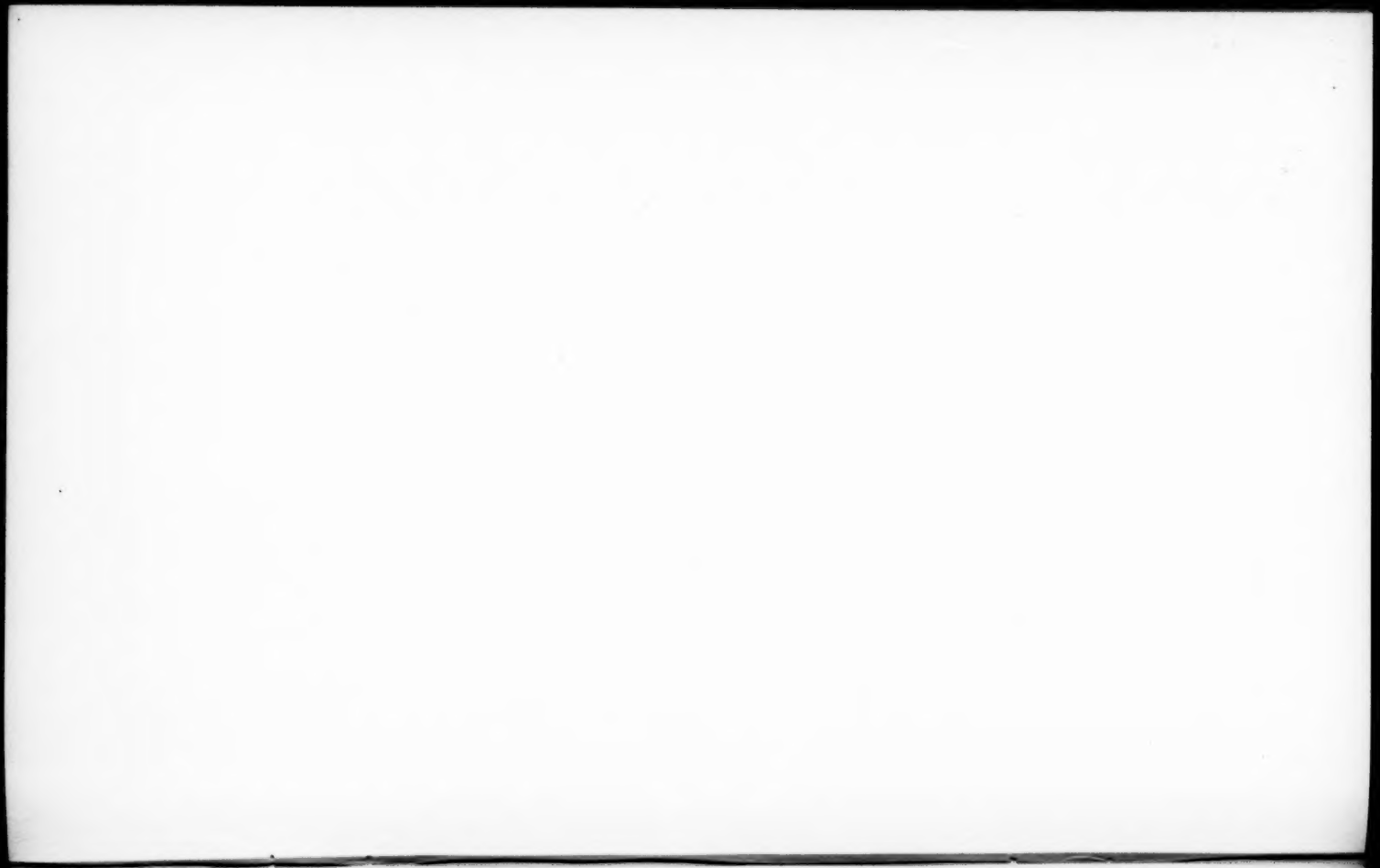
Discosia Pini sp. nov.

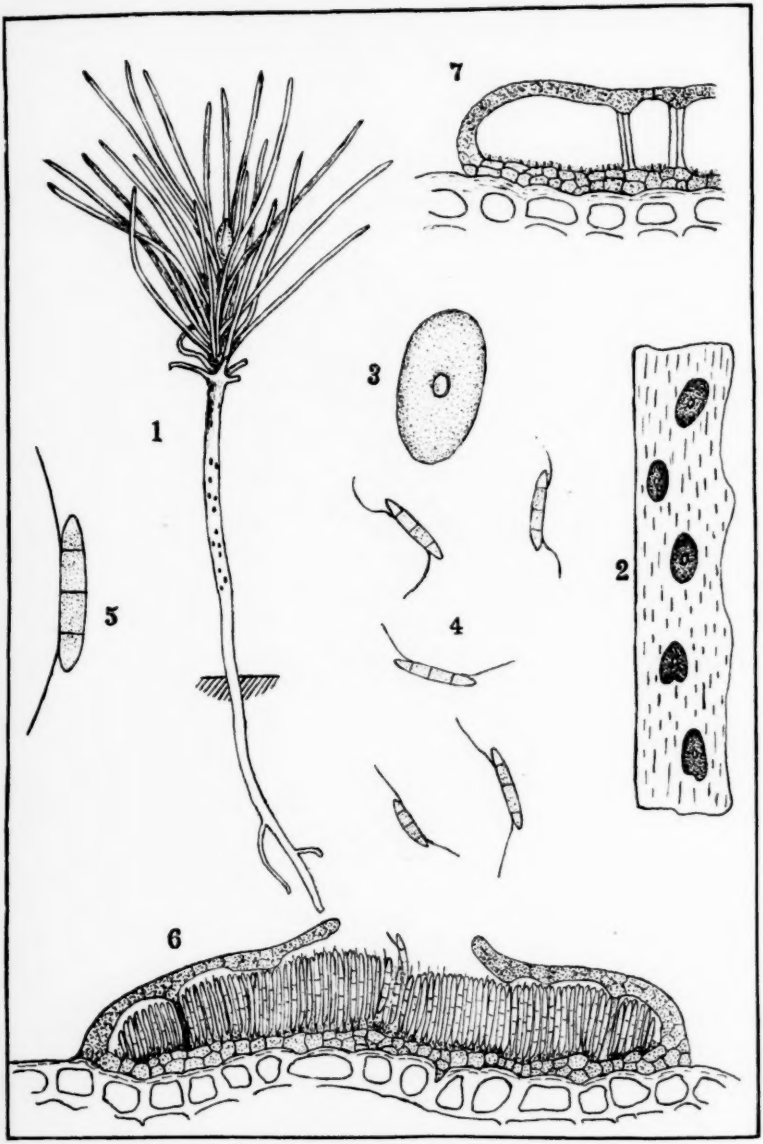
Peritheciis sparcis vel subgregariis, superficialibus, applanatis, nigris, opacis, glabris, ostiolo subpertusis; ellipticis vel leniter lobulatis, 225–362 μ = 120–165 μ; sporulis oblongo-fusiformis, 3-septatis, hyalinis vel leniter fumagineis, 12–20 = 2.6 μ, 2-ciliatis, 10–12 μ longis (*pl. 14, f. 1–7*).

Ad hypocotylem viventem *Pini ponderosae,* Forest Reserve, Halsey, Nebraska.

Type specimen, No. 758, Herb. Dept. Agric. Bot., Univ. of Nebraska, Lincoln, Nebraska.

DEPARTMENT OF BOTANY,
UNIVERSITY OF TEXAS.





DISCOSIA PINI HEALD

EXPLANATION OF PLATE XIV.

FIG. 1. One year old seedling of *Pinus ponderosa,* showing pycnidia on the hypocotyl. Natural size.

FIG. 2. Pycnidia showing variation in form.

FIG. 3. Single pycnidium showing the typical elliptical form and central ostiole.

FIG. 4. Group of spores, showing form, septation, and number of cilia.

FIG. 5. Single spore, much enlarged, showing insertion of the cilia.

FIG. 6. Complete cross-section of pycnidium, showing position and arrangement of the spores, character of pycnidium wall, and slightly protruding lips of the ostiole.

FIG. 7. Portion of cross-section of a pycnidium with spores removed to show two of the vertical supporting pillars or columns.

NOTEWORTHY ADDITIONS TO THE MYCOLOGICAL HERBARIUM

Four Interesting Species of Moulds

In the study of moulds at the New York Botanical Garden during the month of July, 1909, the following interesting species were found and placed in the herbarium.

Mucor rufescens Fischer. This species was found in considerable quantity on elephant's dung. It is very distinct and easily recognized by the flaccid sporangiophores forming a network over the substratum, and by the orange-colored substance in the columella and upper part of the sporangiophore.

Mucor circinelloides van Tieghem. This species is very variable in its mode of branching, but the circinellate branches are usually evident. It was cultivated on bread.

Pilobolus longipes van Tieghem. The elongated, worm-like swelling at the base of the sporangiophore is very characteristic of this species. Found on horse dung.

Circinella umbellata van Tieghem & Le Monnier. This beautiful species is generally found with *Thamnidium elegans* Link. It was collected on dung of jaguar.

David R. Sumstine.

A New Boletus from Tropical America

Boleti are exceedingly scarce in tropical America, and, indeed, in all tropical countries. This is true also of certain genera of large, fleshy agarics, such as *Russula* and *Lactaria*. The extremes of moisture and dryness may be too great for these plants, which are essentially terrestrial, as opposed to many tropical forms of agarics that occur on dead wood; they may lack the association and substratum connected with certain trees of temperate regions, such as oaks and chestnuts; they may have been partially or totally cut off from these regions by certain barriers in the course of geographical distribution; or they may be temperate

species, unadapted to tropical conditions generally, as is the case with many of our common higher plants.

The first boletus reported from tropical America was collected by Oersted in volcanic soil on the Irasi volcano, Costa Rica, and described by Fries in 1851 as *Boletus robustus*. In 1868, two species, *B. cubensis* and *B. lignatilis*, were described by Berkeley from the collections of Wright in Cuba. In 1900, Patouillard described *B. guadalupensis* from specimens collected by Père Duss in Guadeloupe. During the past winter I found *Rostkovites granulatus* quite common at Cinchona, Jamaica; and two collections of *Ceriomyces communis* have recently been sent in from the Bahamas. A new species, collected in Costa Rica by Mr. Maxon, may be characterized as follows:

Ceriomyces Maxoni sp. nov.

Pileus irregularly circular in outline, convex, slightly depressed, 7 cm. broad, 1–1.5 cm. thick; surface glabrous, smooth, very dark brown, almost black near the margin, slightly lighter at the center with dark blotches, margin undulate, involute: context very fleshy; hymenium strongly concave, pure creamy white, tubes adnate, rather short, small, angular, thin-walled, edges becoming lacerate: spores oblong-ellipsoid, smooth, hyaline, 2-guttulate, 9–11 × 3–4 μ: stipe central, thick, tapering downward, 2.5 cm. long, 3 cm. thick at the apex, 1.5 cm. thick at the base, smooth and glabrous below, closely and conspicuously reticulate above, fleshy, solid.

Type collected near Coliblanco, on the slopes of the volcano Turrialba, Costa Rica, at approximately 2,000 meters, among mosses on a rotten log in a clearing in the forest, May 1, 1906, *W. R. Maxon 301*.

W. A. MURRILL.

NEWS AND NOTES

Miss M. F. Barrett spent the month of July at the Garden studying the collections of gelatinous fungi.

Mr. H. S. Jackson has been appointed plant pathologist of the agricultural experiment station at Corvallis, Oregon.

Joseph E. Kirkwood, Ph.D., Columbia, 1903, has been appointed assistant professor of forestry and botany in the University of Montana. He was formerly professor of botany in Syracuse University and for a time a botanical investigator for the Continental-Mexican Rubber Company.

Mr. William T. Horne, who was fellow in botany in Columbia University in 1903–'04, has resigned his position as chief of the department of plant pathology of the Cuban Agricultural Experiment Station and has accepted an appointment as assistant professor of plant pathology in the University of California.

Tropical Life announces a prize of fifty pounds sterling for an essay embodying research work directed towards ascertaining exactly what changes (together with their causes and whether these changes occur during the fermentation process only or while being dried) take place in the cacao bean between the time that it leaves the pod until it is shoveled into the bag for export. For further information those interested may address the editor of *Tropical Life,* 112 Fenchurch St., E. C. London.

Preliminary notes on the genus *Usnea,* as represented in New England, by R. Heber Howe, Jr., appeared in the Torrey Bulletin for June, 1909. The article contains a key to the species and copious notes on their appearance and distribution, accompanied by three plates of illustrations.

Professor John Dearness, of London, Canada, has been spending the summer at Truro, Nova Scotia, engaged in making a collection of fungi.

Dr. C. H. Peck describes twenty-two new species of fungi, mostly agarics, in the June number of the Torrey Bulletin. More than half of these were collected by Professor C. F. Baker at Claremont, California.

The first number of the new botanical journal *Dörfleria*, published by Dörfler in Vienna, appeared in May, 1909, and was widely distributed among botanists. This journal is intended to be an international organ supplying a botanical biblography and reporting upon everything that happens in the botanical world.

Dr. W. A. Murrill, Assistant Director, visited Mountain Lake, Virginia, in July and obtained nearly a thousand specimens of fungi, mostly large fleshy species. This region is moist and heavily wooded, the elevation being over four thousand feet, and its fungous flora has been up to this time practically unknown, although by inference closely related to that of the high mountains of West Virginia and North Carolina.

An exceedingly useful pamphlet on the Diseases of Deciduous Forest Trees, embodying the results of many years of observation and experiment, was issued in June, 1909, as Bulletin No. 149 of the Bureau of Plant Industry, U. S. Department of Agriculture, under the joint authorship of Hermann von Schrenk and Perley Spaulding. This bulletin contains 66 pages of text, a bibliography of 114 citations, and 10 excellent half-tone plates. The more important diseases of deciduous forest trees are here discussed, leaving those peculiar to shade and ornamental trees for another publication.

Dr. Peck's report for 1908, issued in July, 1909, as Museum Bulletin 131, is a volume of 202 pages and 4 colored plates, containing, besides the usual reports on additions to the herbarium, a monographic treatment of the New York species of *Lentinus*

and *Entoloma* and a list of species and varieties of fungi described by Dr. Peck during forty years of remarkable activity. The number of new species of fungi, exclusive of the new varieties, described by him during this period reaches a total of nearly two thousand five hundred. Dr. Peck has, practically speaking, collected his own mycological herbarium and written his own mycological library.

An important pamphlet on Bud Rot and Some Other Cocoanut Troubles in Cuba, by William Titus Horne, was recently issued as Bulletin No. 15 of the Cuban Experiment Station, Santiago de las Vegas. The bud rot has been known in the West Indies for a number of years, where it constitutes the most serious obstacle to the cultivation of the cocoanut. It causes the nuts to drop, the leaves to turn yellow, and the bud, or heart, of the tree to decay. The cause of the disease is still unknown, but it is believed to be bacterial in nature, and there is abundant evidence that healthy trees are infected from diseased ones.

A satisfactory treatment for this disease has not yet been discovered, but it may be held in check by the destruction of the tops of all trees dead or seriously affected with bud rot; by flaming, or burning out the tops, of all early cases, or trees suspected to have the disease; and by spraying with Bordeaux mixture in the hope of curing early cases and for the protection of healthy trees. All three methods have been employed in Jamacia with good results.

A valuable descriptive paper by T. Petch on the Phalloideae of Ceylon, accompanied by eleven handsome plates, appeared in the December number of the Annals of the Royal Botanic Gardens, Peradeniya. Five Ceylon species were collected by Gardner in 1844, and Berkeley described an additional species from Thwaites' collections in 1863–68. To these, Massee later added *Phallus proximus,* and two other species have since been described. The number of species is still considerably behind that of Java, but it may be materially increased when the lower elevations are explored. The species already known exhibit a marked distribution according to altitude.

Mr. Petch is engaged in the very important task of redescribing the fungi of Ceylon, and he has met with many difficulties in his work because of the different sets of types and the inadequate descriptions based on them. He is of the opinion "that the only possible way in which any definite knowledge can be evolved out of the present chaos is that mycologists of each tropical country should work out their species in a similar manner (by comparison with types), and that when this is done they should interchange specimens and colored drawings of at any rate their common forms. But if the original collections were not returned to the sender there is no possibility of ever arriving at a definite conclusion, and the existing records are merely so much waste paper. Certainly the present practice of consigning Basidiomycetae to Europe is a waste of time. The describers not only fail to recognize a species: in many cases they do not hit upon the right genus. The descriptions are unrecognizable, and the 'species' upon which they are founded are often only damaged or abnormal forms of common things. The latter is especially the case when, as so often happens at the present day, the actual collecting is entrusted to coolies. *The mycologist must collect his own specimens and know them under all conditions.*"

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